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THE CARE OF INFANTS DURING THE FIRST YEAR OF LIFE

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FOREWORD

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THE FIRST YEAR OF LIFE

-USSR-

[Following is the translation of an article by Candidate of Medical Science V.F. Vedrashko, Senior research member of the Institute of Nutrition at the USSR Academy of Medical Sciences, entitled "O vskarmliivanií detey pervogo goda zhizni" (English version above) in Zdravookhraneniye Belorussii (Public Health in Byelorussia), No 7, Minsk, 1960, pages 67-69.]

Up to the present time there has been no unanimity of opinion as to the ways of feeding infants. In some foreign countries, including the US, the artificial feeding of children from the first few days of life is recommended and practiced.

Without describing in detail the advantages of breast suckling over artificial feeding, we will merely point out that the nutritional components of human milk are better and more fully utilized by the child's organism not only because of their particular physico-chemical characteristics, but also because unprocessed human milk contains such digestive enzymes as lipase, amylase, and protease, which are not found in foods prepared from the milk of animals. As a result of the high biological value of human milk proteins, the child's requirements for this nutrient are lower in the case of natural feeding than they are if he were being fed on any formula prepared from cow's milk. The protein requirement with natural feeding is 2.0-2.5 grams per kilogram of weight; the corresponding requirement in the case of artificial feeding amounts to 3.5-4.0 grams protein per kilogram of weight.

It must be kept in mind that maternal milk may in some instances be deficient, and though receiving it in

normal amounts, the child may nevertheless exhibit insufficient growth and incorrect development. Studies of the protein and fat content of maternal human milk have revealed that the actual protein content varies over a rather wide range -- from 0.7 to 1.9 percent; the fat content ranges from 1 to 8 percent. Mixtures prepared from the milk of donors, furthermore, are characterized by a particularly low fat and protein content, with the protein content ranging from 0.7 to 1.2 percent, with an 0.88 percent average, and the average fat content being 2.8 percent. On the average, maternal milk contains 1.2 percent protein and about 3.5 percent fat.

The physician establishes the volume of the infant's diet on the basis of these figures. In those cases, however, when the actual protein content amounts to only 0.7 percent, the child will be receiving just half of his requirement for this element; the same statement may be made as regards the fat content in cases where the fatty substances in the milk comprise 2 rather than 3.5 percent.

With the detection of unsatisfactory growth indices, the physician must necessarily prescribe a corrective supplementary diet.

Plasmon, an albuminous preparation containing casein (dried curds), sodium phosphate, sodium citrate, and calcium lactate salts, with protein and fat contents of 75 and 0.5 percent, respectively, is recommended as an additional source of protein. Plasmon is given to children attaining an age of one month in amounts ranging from 2 to 10 grams per day. The substance is dissolved in 10-30 milliliters of human milk, brought to a boiling point with constant stirring, and is then added to strained milk. Along with increasing protein content in the infant's diet, the fat supplement is also increased to 10-20 milliliters per day by the addition of cream. The plasmon-enriched formula is well received by infants; they gain weight rapidly and experience no digestive or intestinal disorders. Grain decoctions should not be administered to children as dietetic supplements over extended periods.

Infants receiving a mixture of kefir and human milk as part of a mixed diet upon attaining an age of two months develop quite well. Carbohydrates in the form of sugar are added to the mixture. The amount of kefir is increased gradually, starting with 10 milliliters each feeding time.

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The child should be given curds and cream in the diet as supplementary sources of protein and fat.

The dairy industry puts out various food products in dried and concentrated form for very young children. These include dry whole milk, semi-fat, non-fat, and acidophilus milk, humanized milk, milk and cereal decoctions, dry sugarless cream, sugarless condensed milk, hydrolyzed casein, casein milk, and various dry-milk cereals. There is little difference between reconstituted whole milk and fresh milk. All forms of baby food may be prepared from the different varieties of reconstituted dry milk, including sour-milk formulas.

Although humanized milk is equivalent to actual human milk as regards the protein, fat, and carbohydrate content, it does not measure up to the latter with respect to a variety of biological standards, including the content of several amino acids such as tryptophan, and also in its vitamin content -- and for this reason cannot completely replace human milk.

Hydrolyzed casein and casein (dried protein) milk, which are prepared from non-fat dried curds, may both be used as protein supplements in addition to plasmon. These preparations have a pleasant taste, and have a high resistance to spoilage while in storage.

In addition to milk products and preparation, the food industry also puts out rice, buckwheat, and oatmeal flours for very young children. Porridges may be prepared using a mixed flour in order to vary the amino acid protein balance. Homogenized purees, puree soups, and mixed vegetable and meat soups provide additional dietetic supplements.

Sour milk products are widely used in the feeding of infants. These are in some ways superior to bland foods, in that the proteins are present in curdled form, and the curds themselves being friable, tender, and easily saturated by the digestive enzymes. Sour milk products in the form of kefir and acidophilus milk are introduced into the infant's diet at a very early age, along with cereal decoctions, or, as is done in our clinic, with human milk.

With all of the various types of feeding, children must also receive vitamins contained in fruit and vegetable juices, cod-liver oil, and yeast. The addition of vitamin preparations containing A, D, and B-complex vitamins, as well

As ascorbic acid is thus necessary for a good diet.

The Vitamin Requirements of Children

Age	A, in I.U.	B ₁ in mg	B ₂ in mg	PP in mg	C in mg	D in I.U.
1-3 months	1500	0.4	0.5	4.0	30	400
4-9 months	1500	0.5	0.8	5.0	30	400
10-12 months	1500	0.5	0.9	5.0	30	400
1-3 years	2000	0.6	1.0	6.0	35	400

[I.U. = International Units; mg = milligrams]

(The above table was compiled by Prof. V.V. Yefremov on the basis of technical reference materials).

Our studies revealed that the correct feeding of infants requires an additional 60 milliliters of liquids. Infants drink sweetened water best of all, and vegetable decoctions are also well received. Keeping in mind the fact that these vegetable decoctions have a pleasing taste and contain vitamins and minerals, they must be recognized as the best source of additional liquids for children during the first year of life.